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Digital Originality

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Recommended Citation

Edward Lee, *Digital Originality*, 14 Vand. J. Ent. & Tech. L. 919 (2012).

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Digital Originality

Edward Lee*

[The creative act] is an act of liberation—the defeat of habit by originality.¹

ABSTRACT

This Article examines the doctrine of originality in U.S. copyright law and proposes a reconfigured, three-part test that can better analyze issues of first impression involving works created with new digital technologies. The proposed test, encapsulated by the concept of digital originality, provides much needed guidance to courts to address the increasing complexities of digital creations in the twenty-first century.

TABLE OF CONTENTS

I.	ORIGINALITY IN THE DIGITAL AGE	922
A.	<i>Originality</i>	922
1.	<i>Feist</i> Test	922
2.	Recent Debate among Scholars	924
B.	<i>Digital Creations</i>	925
1.	<i>Meshwerks</i>	925
2.	Complexities of Digital Creations.....	933
a.	<i>Copying and Customization among the Masses</i>	933
b.	<i>Less Human Input and Artificial Intelligence</i>	934
c.	<i>Dynamic, Fluid, and Complex Relationships</i>	934
II.	PROPOSAL: DIGITAL ORIGINALITY	935
A.	<i>Moving to a Three-Part Test of Originality</i>	935
1.	Independently: Not Copied from Other Works	936

* © 2012 Edward Lee. Professor of Law, Director, Program in Intellectual Property Law, IIT Chicago-Kent College of Law, Norman and Edna Freehling Scholar. Many thanks to the participants of the Copyright and Creativity Symposium hosted by the VANDERBILT JOURNAL OF ENTERTAINMENT AND TECHNOLOGY LAW. Special thanks to Eva Subotnik, Saif Khan, Renae Resch, Daniel D'Addario, and James Baldwin for comments on an earlier draft. Amy Harvey and Roberto Martell Jr. provided excellent research assistance and comments on the Article, particularly related to art theory and computer-aided design. Claire Alfus ably assisted with the charts.

1. ARTHUR KOESTLER, *THE ACT OF CREATION* 96 (Penguin Books Ltd. 1995) (1964).

2. Create a "Work": Intellectual Production within Subject Matter of Copyright	940
3. Modicum of Creativity	942
B. <i>Application of Three-Part Test</i>	943
1. Revisiting <i>Meshwerks</i>	944
a. <i>Independently</i>	944
b. <i>Create a Work</i>	945
c. <i>Modicum of Creativity</i>	946
2. 3D Printers	948
a. <i>Independently</i>	948
b. <i>Create a Work</i>	949
c. <i>Modicum of Creativity</i>	950
3. Siri on iPhone	950
a. <i>Independently</i>	951
b. <i>Create a Work</i>	951
c. <i>Modicum of Creativity</i>	953
C. <i>Advantages of the Three-Part Test of Originality</i>	953
III. RESPONDING TO CONCERNS	954
A. <i>Complicating Originality</i>	954
B. <i>Backsliding to Photography or Non-Digital Works</i>	955
C. <i>Defending Meshwerks</i>	956
IV. CONCLUSION	957

Originality is the most fundamental requirement of U.S. copyright law. As the U.S. Supreme Court explained in *Feist Publications, Inc. v. Rural Telephone Service Co.*, the Copyright Clause requires originality as a basic prerequisite to the grant of copyright for every work, meaning: (1) the work must be independently created with (2) a modicum of creativity.² However, the precise contours of these requirements remain obscure. Like obscenity, originality is a doctrine perhaps best described by the (non)principle of "I know it when I see it,"³ meaning judges are left considerable discretion to decide the issue. Fortunately, in the more than twenty years following *Feist*, the lack of clarity in the doctrine of originality has not posed a serious problem. Because the threshold for originality is so low, most works easily pass the test, thereby obviating the need for courts to explain the doctrine in depth.⁴

This happy doctrinal détente is now under siege. Increasingly, creations from new digital technologies raise confounding questions of originality, making problematic the notions of both "independent

2. *Feist Publ'ns, Inc. v. Rural Tel. Serv. Co.*, 499 U.S. 340, 345 (1991).

3. *Jacobellis v. Ohio*, 378 U.S. 184, 197 (1964) (Stewart, J., concurring).

4. *Feist*, 499 U.S. at 345.

creation” and a “modicum of creativity.”⁵ Put simply, copyright law’s traditional notions of authorship are strained when machines do much, if not all, of the creating.⁶ For example, three-dimensional (3D) printers can make virtually any object, such as a sculpture, in three dimensions.⁷ A human must create (though in some cases can just copy) the design of the object, but the printer does the rest. As Chris Anderson of *Wired* put it, “If you can draw it, we can make it.”⁸ Are the 3D objects created by these printers original expression? If so, who owns the copyright—the printer manufacturer, the user, or someone else? Consider also the popular iPhone 4S, with its artificially intelligent personal assistant named Siri, who answers, both by text and by voice, any question an iPhone user asks.⁹ Are Siri’s conversations copyrightable? If so, who owns the copyright—Apple, the user, or perhaps Siri itself? Ask Siri and it is resigned to answer: “I don’t understand.”¹⁰

Courts have yet to grapple with these perplexing questions. Yet one court of appeals’s decision, *Meshwerks, Inc. v. Toyota Motor Sales U.S.A., Inc.*,¹¹ presages the difficulty of these questions. In *Meshwerks*, the U.S. Court of Appeals for the Tenth Circuit ruled controversially that a wire-frame digital model of a Toyota car, created by humans with the aid of computers, lacked originality, despite the human expertise and skill needed to create the model in a realistic manner and with a 3D appearance.¹² If courts apply the Tenth Circuit’s approach to other digital creations, such as works from 3D printers, copyright law may deny protection to many digital works for lack of originality. Although this result might be defensible, the reasoning must be more carefully thought out before courts begin to deny copyrights to a whole class of works.

This Article begins that undertaking. Part I examines the doctrine of originality and the challenges posed by digital technologies. It dissects the *Meshwerks* case and its confused reasoning. Part II proposes a more fully articulated test of originality—under the

5. See *infra* notes 85-96 and accompanying text.

6. See *infra* notes 86-91 and accompanying text.

7. See *Print Me a Stradivarius: How a New Manufacturing Technology Will Change the World*, ECONOMIST, Feb. 10, 2011, <http://www.economist.com/node/18114327>; Roger Yu, *More Design Hobbyists, Entrepreneurs Use 3D Printing*, USA TODAY, Feb. 20, 2012, <http://www.usatoday.com/tech/news/story/2012-02-20/3D-printing/53179186/1>.

8. See FORA.tv, *3D Printing: If You Can Draw It, You Can Make It*, YOUTUBE (June 23, 2010), <http://www.youtube.com/watch?v=8XeLtaqF4ws>.

9. See *iPhone 4S—Ask Siri to help you get things done*, APPLE, <http://www.apple.com/iphone/features/siri.html> (last visited Feb. 22, 2012).

10. *Siri, Are Your Answers Copyrightable?*, SIRI FOR IPHONE 4S (on file with author).

11. *Meshwerks, Inc. v. Toyota Motor Sales U.S.A., Inc.*, 528 F.3d 1258 (10th Cir. 2008).

12. *Id.* at 1266.

doctrine of “digital originality”—to deal with the controversies raised by digital technologies in cases involving novel or difficult issues of law regarding originality. The proposed test reconfigures the test of originality from a two-part to a three-part test, and then more fully delineates each part. Part II also discusses studies related to the artistic process that add greater insight to understanding originality, especially regarding realistic depictions of objects in the world. To demonstrate how the revised test operates, Part II applies it to the digital models in *Meshwerks*, 3D printed objects, and Siri’s answers. Under the proposed test, *Meshwerks* would come out differently—the digital models of the Toyota car should satisfy originality. Part III addresses concerns.

I. ORIGINALITY IN THE DIGITAL AGE

This Part explains the doctrine of originality and examines how digital technologies raise difficult issues for the doctrine—presenting more substantial challenges than experienced in the past. As digital creations become more automated and the process of creation and relationships among actors become more fluid, notions of originality will become more strained.

A. Originality

Originality is the most important requirement for obtaining a copyright. Although the basic contours of the doctrine are straightforward, some commentators have recently expressed dissatisfaction with the doctrine.¹³ Before delving into the complexities that digital creations pose, the following section provides a brief refresher on the basics of the doctrine.

1. *Feist* Test

In 1991, in the landmark *Feist* decision, the Supreme Court clarified the doctrine of originality and its status as a constitutional requirement of the Copyright Clause.¹⁴ To some copyright commentators, the Court’s constitutional ruling was a surprise.¹⁵ But

13. See *infra* notes 22-28 and accompanying text.

14. *Feist Publ’ns, Inc. v. Rural Tel. Serv. Co.*, 499 U.S. 340, 346-48 (1991).

15. See, e.g., 1 PAUL GOLDSTEIN, COPYRIGHT: PRINCIPLES, LAW AND PRACTICE § 2.2.1 (3d ed. Supp. 2012) (casting doubt on the precedential support for originality’s status as a constitutional requirement).

other commentators shared the view adopted by the *Feist* Court.¹⁶ Indeed, the Court drew from, of all places, *Nimmer on Copyright* to articulate the following constitutional test of originality: “Original, as the term is used in copyright, means only that the work was independently created by the author (as opposed to copied from other works), and that it possesses at least some minimal degree of creativity.”¹⁷

Since the decision, over 550 lower court decisions have discussed or applied the *Feist* test of originality.¹⁸ Yet most copyrighted works have no difficulty satisfying the low threshold of originality. As the *Feist* Court stated, “[t]he vast majority of works make the grade quite easily.”¹⁹ Even in the few areas that have presented more litigated issues of originality, such as compilations, derivative works, maps, and photographs, courts have not had much difficulty applying the test of originality.²⁰

16. See *Feist*, 499 U.S. at 347 (citing 1 MELVILLE B. NIMMER & DAVID NIMMER, NIMMER ON COPYRIGHT § 1.08(C)(1) (1990); L. Ray Patterson & Craig Joyce, *Monopolizing the Law: The Scope of Copyright Protection for Law Reports and Statutory Compilations*, 36 UCLA L. REV. 719, 763 n.155 (1989)).

17. *Id.* at 345 (citing 1 MELVILLE B. NIMMER & DAVID NIMMER, NIMMER ON COPYRIGHT § 2.01(A)-(B) (1990)). Of course, the Supreme Court can articulate a constitutional principle based on any source it fancies, but one might expect the Court to rely directly on its own precedents for constitutional law rather than on secondary sources such as a treatise.

18. *Feist /p Originality*, WESTLAW, <http://www.westlaw.com> (follow “Search” hyperlink and select “Terms & Connectors” hyperlink; then select “U.S. Courts of Appeals Cases” and “U.S. District Court Cases” hyperlinks; then enter “Feist /p originality” in the “Search” hyperlink) (last visited Feb. 1, 2012).

19. *Feist*, 499 U.S. at 345.

20. See, e.g., *Universal Furniture Int’l, Inc. v. Collezione Europa USA, Inc.*, 618 F.3d 417, 430 (4th Cir. 2010) (“For compilations of preexisting elements, ‘the principal focus should be on whether the selection, coordination, and arrangement are sufficiently original to merit protection.’” (quoting *Feist*, 499 U.S. at 358)); *Darden v. Peters*, 488 F.3d 277, 287 (4th Cir. 2007) (“Additions to the preexisting maps such as color, shading, and labels using standard fonts and shapes fall within the narrow category of works that lack even a minimum level of creativity”); see also *Schrock v. Learning Curve Int’l, Inc.*, 586 F.3d 513, 519 (7th Cir. 2009) (discussing a liberal standard of originality for photographs based on staging or rendition of the scene, “except perhaps for a very limited class of photographs that can be characterized as ‘slavish copies’ of an underlying work”). *Schrock* also held that “(1) the originality requirement for derivative works is not more demanding than the originality requirement for other works; and (2) the key inquiry is whether there is sufficient nontrivial expressive variation in the derivative work to make it distinguishable from the underlying work in some meaningful way.” *Schrock*, 586 F.3d at 521.

2. Recent Debate among Scholars

The relative lack of controversy over the doctrine of originality in cases has not stopped academics from raising several controversies of their own. Some scholars believe that originality is too permissive or indiscriminate in allowing works to qualify for copyright.²¹ For example, Professor Joseph Miller argues that originality should incorporate something akin to a nonobviousness requirement from patent law, thereby imposing a much higher standard for works to qualify for copyright.²² Miller proposes this new standard to decrease the number of works eligible for copyright and thereby reduce the extent to which copyright permeates people's daily lives.²³ Likewise, Professors Gideon Parchomovsky and Alex Stein contend that copyright law should be changed to give greater or lesser protection depending on whether the work has more or less originality.²⁴ In their view, which curiously lacks any empirical or anecdotal support, "the current approach incentivizes production of too many works at the low end of the originality spectrum and a suboptimal number of truly original works."²⁵ Other scholars share Parchomovsky and Stein's criticisms of originality under current doctrine.²⁶

By contrast, Professor Eva Subotnik suggests that the current low threshold of originality is probably the best courts can do in delineating the doctrine because "courts are ultimately doomed to fail in the quest to explain, in a satisfying way, how a work of authorship is original in and of itself."²⁷ According to Subotnik, "Caught between the impermissibility of relying upon aesthetic virtues, on the one hand, and the degree of effort expended by an author, on the other, the closest courts can come to identifying originality, at least under the current copyright framework, is through proxies for the legal concept."²⁸

Although illuminating, the recent debate among scholars over originality has yet to confront the more pressing problem the doctrine

21. See *infra* notes 22-26 and accompanying text.

22. See Joseph Scott Miller, *Hoisting Originality*, 31 CARDOZO L. REV. 451, 457-63 (2009).

23. *Id.*

24. See Gideon Parchomovsky & Alex Stein, *Originality*, 95 VA. L. REV. 1505, 1507 (2009).

25. *Id.* at 1506.

26. See Shyamkrishna Balganesh, Response, *Tiered Originality and the Dualism of Copyright Incentives*, 95 VA. L. REV. IN BRIEF 67, 67 (2009) ("Parchomovsky and Stein are indeed correct to lament the meaninglessness of originality under current copyright doctrine.").

27. Eva E. Subotnik, *Toward a Theory of Copyright and Creativity*, 76 BROOK. L. REV. 1487, 1494 (2011).

28. *Id.* (footnote omitted).

faces: its application to digital creations. Digital creations will increasingly test copyright's understanding of originality in ways not encountered before.

B. Digital Creations

The *Meshwerks* case, decided in 2008, previewed the challenges that digital creations present.²⁹ As the Section below explains, the Tenth Circuit's analysis is questionable on several fronts.³⁰

1. *Meshwerks*

Meshwerks is a "3D Digital Content Creation Studio using state of the art technology to provide highly creative 3[D] solutions for film, commercial, broadcast television and game companies."³¹ In 2003, Toyota hired Meshwerks to help create digital models of Toyota cars for use by an ad agency working for Toyota.³² The digital models provided better substitutes for photographs because users can adjust the models—such as in color, background, styling—by computer, thereby replacing the need to retake photos for such changes in the future.³³

Meshwerks was responsible for creating 3D digital wire frames of the Toyota cars; the wire frames look like a skeletal or lattice framework depicting the cars.³⁴ One of Meshwerks's wire-frame models (submitted to the court) is reproduced below in Figure 1:

29. See generally *Meshwerks, Inc. v. Toyota Motor Sales U.S.A., Inc.*, 528 F.3d 1258 (10th Cir. 2008).

30. *Meshwerks* has generated considerable criticism already. See, e.g., Andrew C. Landsman, Comment, *Fender Bender: 3D Computer Modeling of Commercial Objects and the Meshwerks v. Toyota Decision*, 8 J. MARSHALL REV. INTELL. PROP. L. 429, 430 (2009); Michael Palumbo, Note, *Copyright Protection for the Fruits of Digital Labor: Finding Originality in Digital Wire-Frames*, 44 NEW ENG. L. REV. 127, 127-28 (2009); see also Dennis S. Karjala, *Copyright and Creativity*, 15 UCLA ENT. L. REV. 169, 184-85 (2008) (arguing that the better approach would have been to allow copyright, but "the scope of protection should be narrowed to the point that only slavish copying—through the modern equivalents of photocopying, like the use of molds for three-dimensional works—is held to infringe").

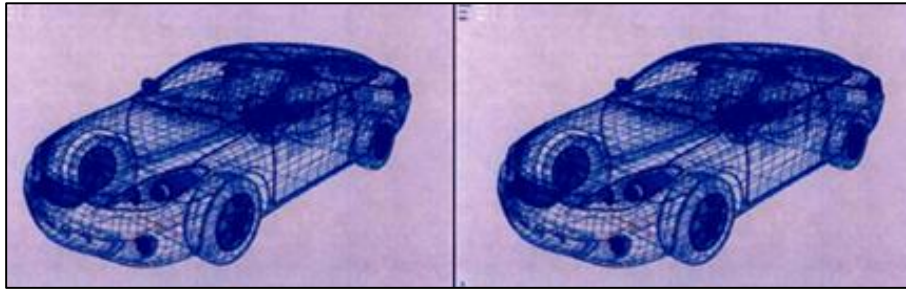
31. *About Us*, MESHWERKS, <http://www.meshwerks.com> (follow "About Us" hyperlink) (last visited Feb. 22, 2012).

32. *Meshwerks*, 528 F.3d at 1260.

33. *Id.*

34. *Id.*

Figure 1. Meshwerks's wire-frame depiction³⁵



The user or viewer could presumably rotate the wire-frame model of the car to different angles on the computer.³⁶

Meshwerks's process for creating the wire frames involved three steps. First, in the measurement stage, "Meshwerks took copious measurements of Toyota's vehicles by covering each car, truck, and van with a grid of tape and running an articulated arm tethered to a computer over the vehicle to measure all points of intersection in the grid."³⁷ Second, in the mapping stage, "the vehicles' data points (measurements) were mapped onto a computerized grid and the modeling software connected the dots to create a 'wire frame' of each vehicle."³⁸ Third, in the sculpting stage, Meshwerks employees had to fine-tune or "sculpt" the wire-frame models manually on the computer because the computer-generated model of the car after the second stage was relatively crude.³⁹

In the sculpting phase, the amount of human input by Meshwerks's employees in creating the digital model of the car was extensive:

Approximately 90 percent of the data points contained in each final model, Meshwerks represents, were the result . . . of the skill and effort its digital sculptors manually expended at the [sculpting] step. For example, some areas of detail, such as wheels, headlights, door handles, and the Toyota emblem, could not be accurately measured using current technology; those features had to be added at the . . . "sculpting" stage, and *Meshwerks had to recreate those features as realistically as possible by hand, based on photographs. Even for areas that were measured, Meshwerks faced the challenge of converting measurements taken of a three-dimensional car into a two-dimensional computer representation; to achieve this, its modelers had to sculpt, or move, data points to achieve a visually convincing result.* The purpose and product of these processes, after nearly 80 to 100 hours of effort per vehicle, were two-dimensional wire-frame

35. *Id.* at 1271 app. A.

36. *Id.* at 1265 (stating that the wire-frame car lacked a choice on "the angle at which to pose it").

37. *Id.* at 1260.

38. *Id.* The court grouped the mapping and measurement stages together. *See id.* For clarity, this Article distinguishes the two.

39. *Id.* at 1261.

depictions of Toyota's vehicles that appeared three-dimensional on screen, but were utterly unadorned—lacking color, shading, and other details.⁴⁰

The legal dispute in *Meshwerks* arose over the terms of the license for the Meshwerks wire-frame model.⁴¹ According to Meshwerks, the license allowed Toyota only a single commercial use of the wire-frame model, but Toyota used the model in subsequent advertisements.⁴² After registering with the Copyright Office the copyright for its wire-frame model of the Toyota car, Meshwerks sued Toyota and Toyota's ad agency for copyright infringement.⁴³ As a defense, Toyota argued that Meshwerks's wire-frame models "lacked sufficient originality to be protected by copyright" because "any original expression found in Meshwerks' products was attributable to the Toyota designers who conceived of the vehicle designs."⁴⁴

The trial court agreed with Toyota and held "that the wire-frame models were merely copies of Toyota's products, not sufficiently original to warrant copyright protection."⁴⁵ On appeal, the Tenth Circuit affirmed, concluding that "Meshwerks' models are not so much independent creations as (very good) copies of Toyota's vehicles."⁴⁶ Therefore, viewed as merely copies, Meshwerks's wire frames flunked the test of originality.⁴⁷

The appellate court's decision is not a model of clarity. At the outset, the court noted its difficulty with the issue presented: "how might that doctrine apply in an age of virtual worlds and digital media that seek to mimic the 'real' world, but often do so in ways that undoubtedly qualify as (highly) original?"⁴⁸ Although the court identified the right question, its opinion ambled between (1) originality cases involving photographs⁴⁹ and (2) originality cases involving factual compilations.⁵⁰ The court's conflation of these cases is apparent in the court's string citation of cases that the court believed stood for the principle that copyright does not extend to "copies of facts in the world, as well as copies of prior works of art."⁵¹ This error infected the court's holding: "[W]e hold . . . that, standing

40. *Id.* at 1260-61 (emphasis added).

41. *Id.* at 1261.

42. *Id.*

43. *Id.*

44. *Id.*

45. *Id.*

46. *Id.* at 1264.

47. *Id.*

48. *Id.* at 1263.

49. *See id.* at 1263-66.

50. *See id.* at 1264-65.

51. *Id.* at 1267.

alone, “[t]he fact that a work in one medium has been *copied from a work* in another medium does not render it any the less a ‘copy.’”⁵²

Lost in the sea of the court’s string citation is the fact that the Toyota car is *not* a work of expression. It is a car—an uncopyrightable useful article.⁵³ That key factual distinction renders irrelevant nearly all of the cases and authorities cited by the Tenth Circuit to support its holding.⁵⁴ The *Feist* Court explicitly stated that “independently create[]” meant not “copied from other works.”⁵⁵ In *Meshwerks*, the Toyota cars are not works of expression—they are useful articles, devices whose designs are inseparable from the functions they serve. Therefore, depicting those useful objects in one’s own drawing or representation is not “copying” in the *Feist* sense. Most courts that have addressed the issue recognize originality in realistic depictions of uncopyrightable things in the world,⁵⁶ although two district courts

52. *Id.* (emphasis added) (quoting 2 MELVILLE B. NIMMER & DAVID NIMMER, NIMMER ON COPYRIGHT § 8.01(B) (2009)).

53. A useful article is not copyrightable unless it has a design that “incorporates pictorial, graphic, or sculptural features that can be identified separately from, and are capable of existing independently of, the utilitarian aspects of the article.” 17 U.S.C. § 101 (2006) (defining “pictorial, graphic, and sculptural works”). Applying this test, the Toyota car design would most likely fail. Under the U.S. Court of Appeals for the Second Circuit’s “design process” test, the court examines what the designer in fact did. *See Brandir Int’l, Inc. v. Cascade Pac. Lumber Co.*, 834 F.2d 1142, 1145-46 (2d Cir. 1987). If the designer was “significantly influenced by functional considerations” in choosing the design elements, those elements will not be separable or copyrightable. *Id.* It is hard to imagine that Toyota’s designers were not significantly influenced by functional considerations in designing the car at issue. The Toyota car looks like a basic sedan, without any artistic embellishments. Under the U.S. Court of Appeals for the Seventh Circuit’s approach, a court may also consider whether “the design creates in the mind of an ordinary observer two different concepts that are not inevitably entertained simultaneously.” *Pivot Point Int’l, Inc. v. Charlene Prods., Inc.*, 372 F.3d 913, 926 (7th Cir. 2004) (quoting *Carol Barnhart Inc. v. Econ. Cover Corp.*, 773 F.2d 411, 422 (2d Cir. 1985) (Newman, J., dissenting)). Under this test, the Toyota car likely fails as well—the features of the Toyota car are arguably impossible to separate from their function to make the car run and perform well as a vehicle. When one looks at the Toyota car, it appears as nothing more than a vehicle for transportation. *But cf. Ferrari S.P.A. Esercizio Fabrice Automobili E Corse v. Roberts*, 944 F.2d 1235, 1245-46 (6th Cir. 1991) (some design features of Ferrari cars were not functional under trademark law and chosen for their distinctiveness and beauty, not utility).

54. The cases involving copying other works relied on by the Tenth Circuit are inapposite. *See ATC Distrib. Grp., Inc. v. Whatever It Takes Transmissions & Parts, Inc.*, 402 F.3d 700, 712 (6th Cir. 2005) (no originality in sketches of transmissions parts “copied from photographs cut out of competitors’ catalogs”) (emphasis added); *Entm’t Research Grp., Inc. v. Genesis Creative Grp., Inc.*, 122 F.3d 1211, 1221-24 (9th Cir. 1997) (copying characters for 3D costumes); *Durham Indus., Inc. v. Tomy Corp.*, 630 F.2d 905, 910 (2d Cir. 1980) (copying Disney characters in plastic); *Bridgeman Art Library, Ltd. v. Corel Corp.*, 36 F. Supp. 2d 191, 197 (S.D.N.Y. 1999) (no originality in slavish photographic copies of public domain paintings lacking any distinguishable variation).

55. *Feist Publ’ns, Inc. v. Rural Tel. Serv. Co.*, 499 U.S. 340, 345 (1991) (emphasis added).

56. *See Satava v. Lowry*, 323 F.3d 805, 812 (9th Cir. 2003) (finding originality in some features of realistic sculpture of a jellyfish); *Kamar Int’l, Inc. v. Russ Berrie & Co.*, 657 F.2d 1059, 1062 (9th Cir. 1981) (finding originality in realistic depiction of animal in stuffed toy

have had some confusion in the case law regarding photographs.⁵⁷ Put simply, realism is not contrary to originality.

Besides *Meshwerks*, no published decision has ever held that a person's own realistic sketch or rendering of an uncopyrightable thing is a mere "copy" of the object that fails the "independently create" requirement of *Feist*.⁵⁸ The only arguably relevant case authority the Tenth Circuit cited involved a simple site map that used stock features, which the case found lacked originality.⁵⁹ There was no suggestion in *Meshwerks* that the digital models of the car were simple stock features.

Ultimately, the court's holding that Meshwerks's digital models were mere copies cannot withstand scrutiny. If the court's analysis were correct, then every realistic pencil sketch of objects in the world, such as the kind Leonardo da Vinci was famous for,⁶⁰ could never

animal); *Kitchens of Sara Lee, Inc. v. Nifty Foods Corp.*, 266 F.2d 541, 544-45 (2d Cir. 1959) (finding originality in realistic photographs of cakes); *Cannon Grp., Inc. v. Better Bags, Inc.*, 250 F. Supp. 2d 893, 901 (S.D. Ohio 2003) (finding originality in realistic drawing of ears of corn); *E. Am. Trio Prods., Inc. v. Tang Elec. Corp.*, 97 F. Supp. 2d 395, 417-18 (S.D.N.Y. 2000) (finding originality in photographs of electrical products); *Dollcraft Indus., Ltd. v. Well-Made Toy Mfg. Co.*, 479 F. Supp. 1105, 1115 (E.D.N.Y. 1978) (finding originality in stuffed toy lambs and bunnies); *R. Dakin & Co. v. A & L Novelty Co.*, 444 F. Supp. 1080, 1083-84 (E.D.N.Y. 1978) (finding originality in stuffed toy fish, frogs, and monkeys).

57. See *Custom Dynamics, LLC v. Radiantz LED Lighting, Inc.*, 535 F. Supp. 2d 542, 549 (E.D.N.C. 2008) (finding no originality in photographs of motorcycle taillights where the "photographs were meant to serve the purely utilitarian purpose of displaying examples of its product to potential consumers, and do not merit copyright protection"); *Oriental Art Printing, Inc. v. Goldstar Printing Corp.*, 175 F. Supp. 2d 542, 545 (S.D.N.Y. 2001) (finding no originality in photographs of Chinese food dishes to sell the food to customers). In determining originality, these cases appear to place great weight on the purpose of the photographs to sell the items they depict. The *Feist* test, however, does not hinge on the commercial or advertising purpose of a work. See, e.g., *Schrock v. Learning Curve Int'l, Inc.*, 586 F.3d 513, 520 (7th Cir. 2009) (noting that "[t]he purpose of the photographs . . . is irrelevant" for originality purposes).

58. In an unpublished decision, the U.S. Court of Appeals for the Sixth Circuit did find a drawing of a spindle bearing failed originality for lack of creativity, because it was a realistic depiction that was common in mail-order catalogs in the industry. See *J. Thomas Distribs., Inc. v. Greenline Distribs., Inc.*, No. 95-2100, 1996 WL 636138, at *1 (6th Cir. Oct. 31, 1996). This decision seems to be wrongly decided, although this author has not reviewed the drawing itself. The proper analysis probably would recognize a thin copyright in the drawing of a spindle that would allow others to draw a spindle as well. Also, some elements of different objects may be uncopyrightable if they are stock elements that must be included in standard depictions of the objects. Courts have dealt with this issue under the idea-expression dichotomy and *scenes a faire* doctrine. See, e.g., *Satava*, 323 F.3d at 810-12. These doctrines are different from originality and when applied, often result in a "thin" copyright granted to depictions of such objects with stock elements as long as there is some minimal level of creativity. *Id.* Such a ruling is much different from *Meshwerks*, which denied copyright to the digital model of the car altogether. *Meshwerks, Inc. v. Toyota Motor Sales U.S.A., Inc.*, 528 F.3d 1258, 1270 (10th Cir. 2008).

59. *Sparaco v. Lawler, Matusky, Skelly, Eng'rs LLP*, 303 F.3d 460, 467 (2d Cir. 2002) (finding site plan using standard cartographic features lacked originality in the selection, coordination, and arrangement of facts).

60. See Albert M. Rosenblatt, *The Interaction of Law and Psychiatry: A Voyage Over the Ages*, 69 ALB. L. REV. 969, 979 (2006) ("Leonardo da Vinci could study the bodies of both the

qualify for a copyright because they would be “mere copies of facts.” That reasoning is contrary to *Feist*, which dealt with compilations of facts (i.e., names and phone numbers) embodied in simple text, not a person’s visual representation of uncopyrightable objects in the world.⁶¹ To consider the two to be one and the same is erroneous. Raw facts are not copyrightable, whereas depictions of the world are.⁶²

Also dubious is the Tenth Circuit’s elevation and application of photography cases to define the litmus test for originality in digital models.⁶³ Based on this analogy, the court reduced the possibilities of satisfying originality for digital models to cases where the creator made “decisions regarding lighting, shading, the background in front of which a vehicle would be posed, the angle at which to pose it, or the like.”⁶⁴ Those are some of the typical bases in which courts deem photographs of objects to be original.⁶⁵ Under prevailing doctrine, virtually all photographs pass the test because a photograph always captures some personality of the taker.⁶⁶ Curiously, though, in the case of Meshwerks’s wire-frame models, the court held that they depicted only “unadorned vehicles” absent “lighting, angle, perspective, and ‘other ingredients’ associated with an original expression.”⁶⁷

There are two major flaws with the court’s analysis. First, the court provided no justification for equating digital modeling entirely with photography.⁶⁸ Although the two may share some similarity in the end products produced—a digital model may yield something akin to a photograph that a user can manipulate—the processes involved in photography and digital modeling are vastly different. As explained

living and the dead and draw anatomical sketches so accurate that they were used by physicians for centuries.”); Boyce Rensberger, *The Art of Science; Eyes of Illustrators Help Scientists to See*, WASH. POST, July 10, 1996, at H1 (describing creativity involved in “rendering three-dimensionality on a two-dimensional surface” in scientific illustrations).

61. *Feist Publ’ns, Inc. v. Rural Tel. Serv. Co.*, 499 U.S. 340, 343 (1991).

62. *See supra* notes 53-56 and accompanying text; *see also infra* notes 112-15 and accompanying text. The following example illustrates this basic distinction: A listing of a person’s name and address is an uncopyrightable fact, but a visual depiction of that person’s house and residence would be potentially copyrightable. The former is a bare, textual description of a fact, while the latter is a person’s particular visual interpretation and rendition of a fact.

63. *See Meshwerks*, 528 F.3d at 1265.

64. *Id.*

65. *Cf. Mannion v. Coors Brewing Co.*, 377 F. Supp. 2d 444, 452-54 (S.D.N.Y. 2005) (discussing possible originality in photographs by rendition, timing, and choice of subject matter).

66. *See, e.g., Ets-Hokin v. Skyy Spirits, Inc. (Skyy I)*, 225 F.3d 1068, 1076 (9th Cir. 2000); *Jewelers’ Circular Publ’g Co. v. Keystone Publ’g Co.*, 274 F. 932, 934 (S.D.N.Y. 1921) (“[N]o photograph, however simple, can be unaffected by the personal influence of the author . . .”).

67. *Meshwerks*, 528 F.3d at 1266.

68. *See generally id.*

above, digital modeling of wire frames involves extensive measuring, computer modeling, and then human sculpting of data points that may require considerable human input, skill, and judgment to render an image that is realistic enough to appear three dimensional, even though represented in two dimensions.⁶⁹ As artists have confirmed, this artistic effect—depicting the two dimensional to appear three dimensional—requires considerable creativity and human thought.⁷⁰ Taking photographs involves none of these steps or human choices, however. A camera’s representation of an object is far more mechanical in this respect. One can merely point and shoot.

By comparison, the critical “sculpting” stage involved in Meshwerks’s models is more akin to drawing or sculpting a figure than photographing it.⁷¹ Just as in drawing or sculpting (but not in photography), Meshwerks’s digital modeling depended primarily on human skill and conception, not mechanical reproduction, to render a realistic expression of the object.⁷²

Second, even if the court uses photography cases as the test of originality for digital models, the Tenth Circuit’s analysis is unconvincing. As noted earlier, the prevailing approach is that virtually any photograph—even from an automatic, point-and-shoot camera—satisfies the originality requirement, on the theory that every photograph captures some aspect of the personality of the person taking the photograph.⁷³ The sole case cited by *Meshwerks* in which the court found certain photographs lacked originality involved photographs of other works, not uncopyrightable objects.⁷⁴

Also dubious is the Tenth Circuit’s conclusion that Meshwerks made no decision regarding lighting, shading, the background, or angle at which the wire-frame car was posed.⁷⁵ Drawing a skeletal, 3D wire-frame representation of a car that can be rotated to different angles, represents a choice regarding at least shading, background,

69. *Id.* at 1267-68.

70. See Gregory P. Garvey, *Life Drawing and 3D Figure Modeling with MAYA: Developing Alternatives to Photo-Realistic Modeling*, 35 LEONARDO 303, 304-05 (2002) (“Creating convincing characters with believable movement requires much more than anatomical correctness. . . . A mastery of drawing and understanding of anatomy and proportion lay the groundwork for making believable corrections, enhancements or distortions to polygonal meshes created from 3D scanning.”).

71. See *id.* at 306 (making connection between traditional drawing and 3D modeling for art workshop); Landsman, *supra* note 30, at 443; Palumbo, *supra* note 30, at 151.

72. *Meshwerks*, 528 F.3d at 1260-61.

73. See *supra* text accompanying note 66.

74. *Meshwerks*, 528 F.3d at 1267 (citing *Bridgeman Art Library, Ltd. v. Corel Corp.*, 36 F. Supp. 2d 191, 197 (S.D.N.Y. 1999)). Wisely, the Tenth Circuit did not rely on two decisions of suspect reasoning that focused on the advertising purpose of the photographs in finding no originality. See *supra* note 57 and accompanying text.

75. *Meshwerks*, 528 F.3d at 1265.

and angle.⁷⁶ The shading is a single color (such as grayscale), akin to a pencil sketch.⁷⁷ The creator uses lines for the wire frames with see-through spaces in between.⁷⁸ Likewise, the absence of a defined background represents a choice about the background, much in the same way photographers choose to have completely white or black backgrounds for artistic effect.⁷⁹ Moreover, the choice to allow the wire-frame car to be turned to numerous angles represents a choice about the various angles in which the car can be viewed and still retain its apparent 3D appearance.⁸⁰ None of these options—gray lines, a blank background, or a changeable pose—is mandated by all computer-aided design (CAD) software for every 3D representation.⁸¹ Just as a sketch artist can choose to go beyond a gray pencil color and blank background, so too a digital artist can choose to go beyond a gray wire frame, blank background, and changeable pose. That either artist sticks with those aforementioned features in her rendition does not somehow disqualify her selection from being a choice of how to create the rendition.

Finally, the Tenth Circuit's analysis incorrectly based its analysis of "independently create" on "(1) an objective assessment of the particular models . . . and (2) the parties' purpose in creating

76. See *supra* note 75 and accompanying text; *infra* notes 77-78 and accompanying text.

77. See, e.g., *Set Color, Screening, Grayscale, and Dither in Plot Style Tables*, AUTOCAD, <http://docs.autodesk.com/ACD/2010/ENU/AutoCAD%202010%20User%20Documentation/index.html?url=WS1a9193826455ffa23ce210c4a30acaf-5f36.htm,topicNumber=d0e142240> (last visited Mar. 23, 2012) (discussing choice of colors on AutoCAD software, including grayscale). This author has used the options available on AutoCAD, a popular computer-aided design (CAD) software, for illustrative purposes. Although Meshwerks used different types of CAD software, it is reasonable to assume the CAD software had comparable, if not even more sophisticated, options. See *infra* note 81.

78. See, e.g., *Create Wireframe Models*, AUTOCAD, <http://docs.autodesk.com/ACD/2010/ENU/AutoCAD%202010%20User%20Documentation/index.html?url=WS1a9193826455ffa23ce210c4a30acaf-67c8.htm,topicNumber=d0e100543> (last visited Mar. 23, 2012) (discussing option of creating wireframe models as one option in addition to using solids, meshes, and objects with thickness).

79. See, e.g., *Display Backgrounds and Shadows*, AUTOCAD, <http://docs.autodesk.com/ACD/2010/ENU/AutoCAD%202010%20User%20Documentation/index.html?url=WS1a9193826455ffa23ce210c4a30acaf-67c8.htm,topicNumber=d0e100543> (follow "Control the Drawing Views" hyperlink; then follow "Change Views" hyperlink; then follow "Shade a Model and Use Edge Effects" hyperlink; then follow "Customize a Visual Style" hyperlink; then follow "Display Backgrounds and Shadows" hyperlink) (last visited Mar. 23, 2012) (discussing option of adding backgrounds and shadows).

80. See, e.g., *Rotate Objects*, AUTOCAD, <http://docs.autodesk.com/ACD/2010/ENU/AutoCAD%202010%20User%20Documentation/index.html?url=WS1a9193826455ffa23ce210c4a30acaf-6a6f.htm,topicNumber=d0e87272> (last visited Mar 23, 2012) (discussing option of rotating object to specified or absolute angles).

81. See *supra* notes 77-80 and accompanying text. On its website, Meshwerks lists several types of CAD software, such as Alias Maya and Inovmetric Polyworks, as a part of its tools. See *Toolbox*, MESHWERKS, <http://www.meshwerks.com> (follow "About Us" hyperlink; then follow "Toolbox" hyperlink) (last visited Mar. 20, 2012).

them.”⁸² As Part II explains, a proper analysis of “independently create” should focus primarily on the subjective process by which the copyright holder created the work, or, in other words, what the copyright holder actually did—copy or not copy another’s work.⁸³ Part II outlines how courts should properly analyze the *Meshwerks* case.⁸⁴

2. Complexities of Digital Creations

Meshwerks is only the tip of the iceberg. In the future, courts will face even more difficult cases of originality involving digital creations. Although courts must wait for the new digital technologies to develop in order to analyze them properly, this Article begins the analysis by making educated predictions about some of the features of digital technologies that will present problems for originality analysis.

a. Copying and Customization among the Masses

One characteristic of digital technologies is that they may offer the masses a convenient tool to copy, but also to customize at the same time. The copying feature will diminish one’s chance of satisfying originality, while the customization feature will help one’s chance. For example, if a person uses a 3D printer to make a toy car that he copies from a public domain design, but adds some artistic elements to the design, he has an arguable claim of authorship to the new part he added.⁸⁵ As new digital technologies, such as 3D printers, become mass produced and marketed to consumers, it is more likely that the average person will become a “creator” and implicate copyright with their productions at home. If millions of people eventually own 3D printers, the possible claims of authorship by ordinary people will reach a level perhaps never experienced before.

82. *Meshwerks, Inc. v. Toyota Motor Sales U.S.A., Inc.*, 528 F.3d 1258, 1264 (10th Cir. 2008).

83. *See infra* notes 101-07, 125-26 and accompanying text.

84. *See infra* notes 146-65 and accompanying text.

85. A toy car design might be copyrightable because it is not a useful article (like a real car). The design of the toy is “merely to portray the appearance of the article”—meaning an actual car—and, therefore, is not considered a useful article. *See* 17 U.S.C. § 101 (2006) (defining “useful article”).

b. Less Human Input and Artificial Intelligence

On the flip side, digital technologies may also reduce the level of human input needed to create works. Computer programs can generate works on their own, with very little human input.⁸⁶ Artificially intelligent programs create works with no human input at all. Imagine, for example, if Siri on the iPhone began creating all of the expression in its answers on its own. Sound fanciful? Already-existing artificial intelligence (AI) programs essentially create their own works of expression.⁸⁷ Take, for example, Narrative Science, a startup company that has developed a computer program that analyzes facts and data, and then creates an article based on the information.⁸⁸ The articles produced are quite impressive—it is virtually impossible to tell that a computer program, and not a human author, created them.⁸⁹ Similarly, for nearly forty years, a computer program named AARON, developed by Harold Cohen, has been creating visual works.⁹⁰ Obviously, current notions of originality are made problematic—if not thrown upside down—to the extent computers take over the creative process and begin creating on their own. With the development of AI, courts will face fundamental questions of whether nonhumans can be “Authors” under the Copyright Clause.⁹¹

c. Dynamic, Fluid, and Complex Relationships

Another feature of digital creations that may give courts problems is the dynamic nature of some creations. Creations may become more fluid and changeable over time.⁹² Consider, for example,

86. See *infra* notes 88-90 and accompanying text.

87. See *infra* notes 88-90 and accompanying text.

88. See Rachel Arndt, *This Article Was Not Written by a Computer*, FAST COMPANY, <http://www.fastcoexist.com/1678779/this-article-was-not-written-by-a-computer> (last visited Apr. 2, 2012); Steve Lohr, *In Case You Wondered, a Real Human Wrote This Column*, N.Y. TIMES, Sept. 10, 2011, <http://www.nytimes.com/2011/09/11/business/computer-generated-articles-are-gaining-traction.html>.

89. See, e.g., *Final: Wisconsin 51, UNLV 17*, BIG TEN NETWORK (Sept. 1, 2011), <http://btn.com/2011/09/01/first-quarter-wisconsin-20-unlv-0>; see also Lohr, *supra* note 88 (noting previous Big Ten Network article was written by Narrative Science artificial intelligence).

90. See Harold Cohen, *The Further Exploits of AARON, Painter*, 4 STAN. HUMAN. REV. 141 (1995), available at <http://www.stanford.edu/group/SHR/4-2/text/cohen.html>.

91. See U.S. CONST. art. 1, § 8, cl. 8.

92. See, e.g., Roberta R. Kwall, *The Lessons of Living Gardens and Jewish Process Theology for Authorship and Moral Rights*, 14 VAND. J. ENT. & TECH. L. 889 (2012) (disagreeing with the Seventh Circuit’s decision that a living garden is not capable of copyright protection and introducing a new way to analyze fluid works under copyright law); see also Kelley v. Chi. Park Dist., 635 F.3d 290, 303 (7th Cir. 2011) (no copyright in “Wildflower Works” landscape art

the new, state-of-the-art “light field” cameras.⁹³ The “focusing” of the picture occurs *after* it is shot.⁹⁴ Any viewer of the photograph can “refocus” the photo by pressing the photo on the computer screen.⁹⁵ The person who took the photo does not control the focusing. Instead, the viewer does. Updates to the software for the camera may add different features to the photos already taken, such as making them viewable in 3D or full focus.⁹⁶ In the above scenario, does the viewer have any claim of authorship by selecting the actual focus of the photograph? What about the software developer who provided, at a later time, enhanced features to view the photograph? If so, are the photographer, viewer, and software developer all joint authors? These are perplexing questions that will require a much deeper understanding of the concept of originality.

II. PROPOSAL: DIGITAL ORIGINALITY

This Part proposes a more fully articulated test of originality for cases involving digital creations. The concept of “digital originality” encapsulates this test. Whether the test should apply universally to all creations under copyright law is left for future analysis.

A. Moving to a Three-Part Test of Originality

Under the conventional account of *Feist*, courts determine originality by a two-part test: the work in question must be (1) independently created, and (2) possess at least a modicum of creativity.⁹⁷ Although this two-part test has worked well

because “a living garden lacks the kind of authorship and stable fixation normally required to support copyright”).

93. See Harry McCracken, *Lytro: What Really Makes It Revolutionary*, CNET NEWS (Oct. 20, 2011), http://news.cnet.com/8301-33200_3-20123224-290/lytro-what-really-makes-it-revolutionary.

94. *Id.*

95. *Id.*

96. See Robert Scoble, *My First Photowalk with Lytro’s Lightfield Camera*, SCOBLEIZER (Dec. 28, 2011), http://scobleizer.com/2011/12/28/lytro_first_use (video discussion at 9:58 minutes and following).

97. *Feist Publ’ns, Inc. v. Rural Tel. Serv. Co.*, 499 U.S. 340, 345 (1991); see *Bridgeport Music, Inc. v. UMG Recordings, Inc.*, 585 F.3d 267, 274 (6th Cir. 2009) (“To be original, an element must both be an independent creation of its author and involve at least minimal creativity.”); *NYMEX, Inc. v. IntercontinentalExchange, Inc.*, 497 F.3d 109, 113-14 & n.4 (2d Cir. 2007) (“Originality is a constitutional requisite and requires that the work was independently created by the author (as opposed to copied from other works) and that it possesses at least some minimal degree of creativity.” (quoting *Feist*, 499 U.S. at 345)); see also 2 WILLIAM F. PATRY, PATRY ON COPYRIGHT § 3:31 (2012) (discussing two requirements of independent creation and creativity); Parchomovsky & Stein, *supra* note 24, at 1507; Subotnik,

enough—even without full explication—in the twenty years following *Feist*, it will face greater strain with the growth of digital creations that raise more confounding questions of originality. Because the two-part test conflates several different concerns, it is likely to create confusion among the courts as they face more difficult cases. Accordingly, to deal with these difficult cases, the courts need to have a better understanding of originality and its constituent parts.

To that end, this Article proposes that originality is better understood as a three-part test: the work must be (1) independently (2) created, and (3) possess at least a modicum of creativity. Under this framework, each part of the test does slightly different work, as summarized in the chart (Figure 2) below and discussed afterwards. Courts should use the three-part test in cases involving digital creations that raise issues of first impression or more complex issues of law than previously faced.⁹⁸

Figure 2. The Three-Part Test of Originality

Independently	Create	Modicum of Creativity
Process	Process + product	Product
Not “copied from other works” = subjective	1. originate - “intellectual production, thought, conception” = subjective	some “creative spark” - can be crude, humble, obvious, not novel - but not so mechanical or routine to be expected as a matter of course - <i>Bleistein</i> proviso = objective
	2. format: a “work” = objective	

1. Independently: Not Copied from Other Works

The first part of the reconfigured test of originality requires that a work be independently made by the author “as opposed to copied from other works.”⁹⁹ Under the conventional account of originality, courts discuss this component as the requirement of “independently create,” or independent creation.¹⁰⁰ The grammatical

supra note 27, at 1490. The Tenth Circuit applied this standard two-part formulation of *Feist* in *Meshwerks*. *Meshwerks, Inc. v. Toyota Motor Sales U.S.A., Inc.*, 528 F.3d 1258, 1263 (10th Cir. 2008).

98. As explained in Part III, whether the test should apply to all cases under copyright law is left for future inquiry. For now, the test is limited to those difficult cases involving digital creations that raise a novel or more complex question of law.

99. *Feist*, 499 U.S. at 345.

100. *Id.*

usage of the adverb “independence” would suggest that consideration of both “independently” and “create” together makes logical sense. However, the pairing of the two concepts has obscured the meaning each respectively contributes to the notion of independent creation. To emphasize those individual contributions, this Article proposes bifurcating the two terms.

The “independent” requirement means that, as the Supreme Court explained in *Feist*, one cannot simply copy another person’s work if one hopes to qualify for a copyright.¹⁰¹ A mere copy of someone else’s work is entirely dependent on the original work for its content. For example, if one prints a copy of Shakespeare’s plays from the Internet, she has not “independently” made the content in the plays. Shakespeare did.

This notion of “independent” work is similar to trade secret law’s concept of independent discovery of a trade secret. An independent discovery of a trade secret, which is categorically permissible without the permission of the trade secret owner, means the third party did not copy the trade secret.¹⁰² Instead, the third party discovered the know-how on her own. Thus, in both copyright and trade secret law, copying is the antithesis of independently making.¹⁰³

Contrary to the analysis in *Meshwerks*,¹⁰⁴ the independence requirement focuses on the process of what the person in fact did instead of the end product.¹⁰⁵ This part of the test is subjective in order to highlight that the process of how the creator came up with the work is key. Comparing the work with a similar work—indeed, even exactly the same work—cannot answer whether the work in question was independently made. Although exactly identical works might suggest copying has occurred, Judge Learned Hand’s famous example of two poets independently creating the same poem, cited favorably by

101. *Id.*

102. *See* *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 490 (1974) (“While trade secret law does not forbid the discovery of the trade secret by fair and honest means, e.g., *independent creation* or reverse engineering, patent law operates ‘against the world,’ forbidding any use of the invention for whatever purpose for a significant length of time.” (emphasis added)).

103. Of course, authors routinely “stand on the shoulders” of those who come before; the ideal of the romantic author who creates in isolation is largely a myth. *See* Madhavi Sunder, *Bollywood/Hollywood*, 12 THEORETICAL INQUIRIES L. 275, 285-92 (2011) (discussing Disney films based on earlier works).

104. *See* *Meshwerks, Inc. v. Toyota Motor Sales U.S.A., Inc.*, 528 F.3d 1258, 1264 (10th Cir. 2008) (making an “objective assessment of the particular models before us”).

105. A somewhat analogous approach is used by courts to determine whether artistic elements are separable from useful articles. *See* *Brandir Int’l, Inc. v. Cascade Pac. Lumber Co.*, 834 F.2d 1142, 1145-46 (2d Cir. 1987) (adopting “design process” test and examining “whether the aesthetic design elements [we]re significantly influenced by functional considerations”).

the Supreme Court in *Feist*, underscores the subjective nature of the independence requirement.¹⁰⁶ As long as the two poets are ignorant of each other's works, both of their identical creations are independently made.¹⁰⁷

One way of thinking about the independence requirement is as a surrogate for copyright infringement. If one merely copies another's work, the copier is not entitled to a copyright. Instead, the copier is an infringer.¹⁰⁸ Conversely, if one independently creates the same work as someone else's, the independent creator has a defense to infringement.¹⁰⁹ This distinction helps to explain why the two poets who create identical works both get copyrights for their works, while the copier who makes the same identical work does not.

Also important to recall is that the independence requirement does not prohibit all copying. It prohibits only copying "from other works"¹¹⁰—i.e., what would constitute copyright infringement.¹¹¹ Copying other works involved in infringement is different from "copying" to depict realistically certain uncopyrightable things in the world. For example, an art student who realistically draws a mountain, machine, or motorcycle has independently made the drawing, even though the artist strives to depict the mountain, machine, or motorcycle in a way that is identical to the real thing. The realistic depiction does not involve copying for the purposes of the originality requirement of independence. As Justice Holmes explained in his famous opinion in *Bleistein*:

It is obvious also that the plaintiff's case is not affected by the fact, if it be one, that the pictures represent actual groups,—visible things. . . . But even if they had been drawn from the life, that fact would not deprive them of protection. The opposite proposition would mean that a portrait by Velasquez or Whistler was common property because others might try their hand on the same face. *Others are free to copy the original. They are not free to copy the copy. The copy is the personal reaction of an individual upon nature.* Personality always contains something unique. It expresses its singularity even in handwriting, and a very modest grade of art has in it something irreducible, which is one man's alone. That something he may copyright unless there is a restriction in the words of the act.¹¹²

106. *Feist Publ'ns, Inc. v. Rural Tel. Serv. Co.*, 499 U.S. 340, 345-46 (citing *Sheldon v. Metro-Goldwyn Pictures Corp.*, 81 F.2d 49, 54 (2d Cir. 1936)).

107. *Id.*

108. *Id.* at 361.

109. See PATRY, *supra* note 97, § 3:30 (discussing "defensive" independent creation).

110. *Feist*, 499 U.S. at 345.

111. Copying from a work in the public domain (meaning not protected by copyright) raises a special problem that is discussed in the context of 3D printing. See *infra* notes 166-71 and accompanying text.

112. *Bleistein v. Donaldson Lithographing Co.*, 188 U.S. 239, 249-50 (1903) (emphasis added) (citations omitted).

In other words, according to Holmes, people are free to depict realistically, or “copy,” “the original” object (e.g., a face) in the world. But people are not free to “copy the copy”; they cannot copy someone else’s copyrighted work depicting the same object. This principle explains why it is unlawful to sell copies of another’s copyrighted map, but perfectly lawful to make a map independently with the exact same facts.¹¹³ Indeed, even the photography case on which the *Meshwerks* court relied (*Skyy I*) recognized this basic distinction between copying a work and depicting an uncopyrightable item.¹¹⁴

The wisdom of Justice Holmes’s admonition in *Bleistein* is widely recognized today. As Judge Posner explained:

If a painter paints from life, no court is going to hold that his painting is not copyrightable because it is an exact photographic likeness. If that were the rule photographs could not be copyrighted—the photographs of Judy Garland in ‘The Wizard of Oz,’ for example—but of course they can be.¹¹⁵

Recent studies of realistic art depictions substantiate the soundness of this approach and Justice Holmes’s dictum.¹¹⁶ Being able to draw or depict an object in realistic fashion requires artistic skill that an artist can develop, but the process of depiction is, in itself, highly subjective to the artist. In one study, neuroscientist R.C. Miall and filmmaker John Tchalenko examined the eye and hand movements of trained and untrained artists sketching a face.¹¹⁷ Using an “eyetracker” device, the study showed a marked difference in the eye movements between trained and untrained artists.¹¹⁸ The trained artist focused steadily for a longer period on the model’s face while drawing but, in between drawing, the artist “would look at his drawing with shorter, more rapid fixations or, alternatively, with smooth movements that followed the pencil tip across the paper.”¹¹⁹ By contrast, the untrained artist “did not show clear changes in eye

113. See *Rockford Map Publishers, Inc. v. Directory Serv. Co. of Colo.*, 768 F.2d 145, 149 (7th Cir. 1985).

114. See *Skyy I*, 225 F.3d 1068, 1081 (9th Cir. 2000) (“Because Ets–Hokin’s product shots are shots of the bottle as a whole—a useful article not subject to copyright protection—and not shots merely, or even mainly, of its label, we hold that the bottle does not qualify as a ‘preexisting work’ within the meaning of the Copyright Act. As such, the photos Ets–Hokin took of the bottle cannot be derivative works.”); see also *Latimer v. Roaring Toyz, Inc.*, 601 F.3d 1224, 1234–35 (11th Cir. 2010) (suggesting that a photograph of customized motorcycles would not create a derivative work because “Latimer’s photographs can best be described as being ‘based upon’ the ZX-14 motorcycles, useful articles not subject to copyright protection”).

115. *Gracen v. Bradford Exch.*, 698 F.2d 300, 305 (7th Cir. 1983).

116. See *supra* notes 112–15 and accompanying text; see *infra* notes 117–24 and accompanying text.

117. See R.C. Miall & John Tchalenko, *A Painter’s Eye Movements: A Study of Eye and Hand Movement During Portrait Drawing*, 34 LEONARDO 35, 35 (2001).

118. *Id.* at 38.

119. *Id.*

movement when drawing,”¹²⁰ and his gaze on the face was less focused and shorter in duration.¹²¹ Similarly, using sensors attached to the artist’s hand and pencil, the study found that the trained artist displayed a more stable, targeted, and even movement than the haphazard movements of the untrained artist.¹²² Besides these physiological differences among portrait sketch artists of different abilities, the study also revealed the trained artist’s belief that his own drawing was highly subjective: “I’m sure of what I am seeing, I’m not quite sure what I am going to do about it. So I make a decision. The final result is made up of a great many decisions.”¹²³ Even more: “I try to achieve a likeness. But what I want is a likeness *to the reaction I have* to something I can see.”¹²⁴ As the study demonstrates, realistic depictions require skill, individual choices, and the personal reaction and experience of the creator. These attributes reflect an independent act of creation with a wide degree of subjective choices by the artist, not rote copying.

2. Create a “Work”: Intellectual Production within Subject Matter of Copyright

The second part of the originality test is an act of *creating* a work that falls within copyrightable subject matter. The “create” requirement focuses first on the actual process by which the creator made the work in question; at this stage, the requirement is subjective. The “create” requirement also looks at the end product—or “work”—but only for the limited purpose of determining whether the work falls within the realm of copyrightable subject matter, and not some other discipline, such as patents, trademarks, or trade secrets.¹²⁵

120. *Id.*

121. *Id.*

122. *Id.*

123. *Id.* at 39.

124. *Id.* (emphasis added). A study of digital imaging technology used to create printed textile designs found a similar opportunity for the technology to facilitate the creative process. See Cathy Treadaway, *Digital Creativity: The Impact of Digital Imaging Technology on the Creative Practice of Printed Textile and Surface Pattern Design*, 4 J. TEXTILE & APPAREL, TECH. & MGMT. 1 (2004). The level of creativity derived from the digital imaging depends in part “on the intrinsic motivation of the practitioner and [her] psychological attitude to it.” *Id.* at 8.

125. The analogy to draw is to patentable subject matter. Some things such as laws of nature, natural phenomenon, and products of nature are not patentable subject matter. See 35 U.S.C. § 101 (2006); *Bilski v. Kappos*, 130 S. Ct. 3218, 3225 (2010). However, even patentable subject matter such as an invention may not qualify for a patent if it does not satisfy novelty and nonobviousness. See 35 U.S.C. §§ 102-103.

The “work” inquiry is objective and focuses on the end product of whatever act of creation is involved.¹²⁶

In this context, “to create” ties back to the constitutional notion of being an “Author” of a “Writing” under the Copyright Clause.¹²⁷ A person who “creates” is one who has engaged in acts of authorship resulting in a “Writing,” or at least something that falls within the subject matter of copyright. As the Supreme Court has explained, an author is “he to whom anything owes its origin; originator; maker,”¹²⁸ and authorship involves “intellectual production, . . . thought, and conception.”¹²⁹ The result of authorship should be a “Writing,” broadly defined. Writings “are founded in the creative powers of the mind,” and are “the fruits of intellectual labor, embodied *in the form of books, prints, engravings, and the like*.”¹³⁰

“To create” a “work” thus adds a different element than the independence (do not copy) requirement. A person can satisfy the independence requirement, but fail the “to create” requirement. For example, an independent discovery of the know-how related to a trade secret, such as an innovative formula for a mechanical process, would satisfy the “independently” requirement, but not the “create” requirement. Creating know-how or a practical invention is not the same as creating in the authorial sense. The creation must involve something that falls within the subject matter of copyright (“embodied in the form of books, prints, engravings, and the like”).¹³¹ Likewise, one could independently discover a fact or law of nature—satisfying the independence requirement of originality—but still fail the second requirement of creation of a work. As the Court recognized in *Feist*, a

126. The “work” factor might also be included in the third part of test (i.e., modicum of creativity) or as a part all by itself. However, this Article chooses not to include it in the third part of the test, even though it shares some similarity to the objective inquiry under the third part. The “modicum of creativity” analysis has its own developed case law. Combining the “work” analysis with the third part might create unnecessary confusion with existing case law. Such a concern is diminished with the second part (“create”), which has been discussed less in the cases. For simplicity, this Article rejects a four-part test.

127. U.S. CONST. art. 1, § 8, cl. 8; *Feist Publ’ns, Inc. v. Rural Tel. Serv. Co.*, 499 U.S. 340, 346-47 (1991).

128. *Feist*, 499 U.S. at 346 (quoting *Burrow-Giles Lithographic Co. v. Sarony*, 111 U.S. 53, 58 (1884)).

129. *Id.* at 347 (quoting *Burrow-Giles*, 111 U.S. at 59-60).

130. *Id.* at 346 (emphasis added) (quoting *Trade-Mark Cases*, 100 U.S. 82, 94 (1879)).

131. *Id.* (quoting *Trade-Mark Cases*, 100 U.S. at 94). Likewise, as *Feist* teaches, independently compiling a database of facts does not necessarily involve creating a copyrightable work. *Id.* A compiler can become an author by selecting and/or arranging the facts in a way that is ultimately deemed to be sufficiently creative. *Id.* at 349. It goes beyond the scope of this Article to discuss nontraditional types of creations that may present difficult questions of copyrightable subject matter.

discovery of a fact is not an act of creation by an author.¹³² Nor is the creation of a word trademark, such as “Groupon,” no matter how clever it is.¹³³

Although one might consider the ultimate copyrightability of a work under this prong, the better approach is to save that inquiry for the third part of the test. Otherwise, the “create” requirement would become redundant of the requirement of a modicum of creativity—a proposition in no way embraced by *Feist*. Thus, so long as a creator exercises some “intellectual production, . . . thought, [or] conception” to make something in a format that falls within the subject matter of copyright, the second requirement is met.¹³⁴ For example, in *Feist*, Rural Telephone Service satisfied the first two requirements because it (1) independently (2) created a white pages phone directory, which is a type of work within the subject matter of copyright.¹³⁵ Rural, however, failed the third requirement of making a work that had sufficient creativity,¹³⁶ as explained in the next section.

3. Modicum of Creativity

The third requirement—that the work possesses at least a modicum of creativity—is an objective test that focuses not on the process of creation, but on the end product created. In order to determine whether this third requirement is met, one must examine the putative work to see if it has some “creative spark, ‘no matter how crude, humble, or obvious.’”¹³⁷ As the *Feist* Court explained, “the requisite level of creativity is extremely low; even a slight amount will suffice.”¹³⁸ Thus, “[t]he vast majority of works make the grade quite easily.”¹³⁹

However, “[t]here remains a narrow category of works in which the creative spark is utterly lacking or so trivial as to be virtually

132. *Id.* at 347 (“This is because facts do not owe their origin to an act of authorship. . . . [O]ne who discovers a fact is not its ‘maker’ or ‘originator.’” (citing *Burrow-Giles*, 111 U.S. at 58)).

133. *See* 37 C.F.R. § 202.1(a) (2012) (short phrases are not copyrightable).

134. *Feist*, 499 U.S. at 347 (quoting *Burrow-Giles*, 111 U.S. at 59-60).

135. *Id.* at 342; *see id.* at 358 (“Originality requires only that the author make the selection or arrangement independently (*i.e.*, without copying that selection or arrangement from another work), and that it display some minimal level of creativity.”); *id.* at 363 (“This arrangement may, technically speaking, owe its origin to Rural; no one disputes that Rural undertook the task of alphabetizing the names itself.”).

136. *Id.* at 359.

137. *Id.* at 345 (quoting 1 MELVILLE B. NIMMER & DAVID NIMMER, NIMMER ON COPYRIGHT § 1.08(C)(1) (1990)).

138. *Id.*

139. *Id.*

nonexistent.”¹⁴⁰ For example, compilations that are “so mechanical or routine as to require no creativity whatsoever” fail the creativity requirement.¹⁴¹ In *Feist*, an alphabetical listing of phone numbers failed the test because “[i]t is an age-old practice, firmly rooted in tradition and so commonplace that it has come to be expected as a matter of course.”¹⁴²

Though the Court’s explanation provides some guidance, the Court stopped short of defining creativity or what constitutes a “creative spark.” *Feist*’s analysis provides some clues as to what works lack the “creative spark”: (1) works that are “so commonplace that it has come to be expected as a matter of course” and (2) works that are “so mechanical or routine as to require no creativity whatsoever.”¹⁴³ Only a few courts have found works that flunked this low threshold.¹⁴⁴

The Court set a standard that helps courts avoid making difficult aesthetic judgments in the first place. Most works satisfy originality; courts need not engage in searching review for originality. In drawing the line between the vast majority of works that easily satisfy creativity and the narrow class of works that do not, the Court favorably cited Justice Holmes’s “aesthetic nondiscrimination” principle—depicted above in Figure 2 as the *Bleistein* proviso—that instructs judges to avoid evaluating the artistic merit of works except for “the narrowest and most obvious limits.”¹⁴⁵ If courts apply this generous approach to the originality analysis, probing questions on the level of creativity involved in a work are avoided unless the work is of doubtful creativity.

B. Application of Three-Part Test

This Section applies the reconfigured three-part of originality to some digital controversies in order to demonstrate how the test sharpens the analysis. The analysis below shows that the more automated digital creations are, the more problems raised under the

140. *Id.* at 359.

141. *Id.* at 362.

142. *Id.* at 363.

143. *Id.* at 362-63.

144. These have occurred mainly in photography cases. For example, lower courts have held that slavish photographic copies of works in the public domain lack sufficient creativity. See *Bridgeman Art Library, Ltd. v. Corel Corp.*, 36 F. Supp. 2d 191, 196 (S.D.N.Y. 1999); see also *supra* notes 57-59 and accompanying text.

145. *Feist*, 499 U.S. at 359 (quoting *Bleistein v. Donaldson Lithographing Co.*, 188 U.S. 239, 251 (1903)); see also *Campbell v. Acuff-Rose Music, Inc.*, 510 U.S. 569, 582-83 (1994) (citing *Bleistein* and discussing test for determining parody is “whether a parodic character may reasonably be perceived”).

first and second parts of the test. Digital creations are likely to pass easily the test of embodying a minimal degree of creativity, but they may face stumbling blocks in “independently” “creating a work.”

1. Revisiting *Meshwerks*

Under the reconfigured test of originality, the outcome of *Meshwerks* would be different. In short, the digital wire frames created by Meshwerks depicting a Toyota car in 3D fashion had sufficient originality because they were (1) not copied from other works, (2) but, instead, were the result of Meshwerks’s intellectual production and were embodied in a work that (3) had at least a modicum of creativity. Although Meshwerks should receive only a thin copyright for its particular rendition protecting against only slavish copying of Meshwerks’s depiction (others may draw their own renditions of the Toyota car, which itself is not copyrightable), Meshwerks’s wire-frame depiction had sufficient originality.

a. Independently

The first question is whether Meshwerks made something independently as opposed to copying it from other works. The Tenth Circuit held that Meshwerks’s wire-frame depictions of the car were not independent creations, but instead, were “(very good) copies of Toyota’s vehicles.”¹⁴⁶ The court based this reasoning on the mistaken premise that realistic depictions of things in the world are somehow impermissible “copies” under *Feist*.¹⁴⁷ But, as Justice Holmes admonished, one can always “copy” what exists in real life and still receive copyright protection; one simply cannot copy someone else’s copy (meaning someone else’s work).¹⁴⁸ What the Tenth Circuit failed to apprehend is that Toyota’s vehicles, as useful articles, are not copyrightable works.¹⁴⁹ An author can freely depict a Toyota car just as he can depict Mt. Kilimanjaro or a motorcycle. All three are uncopyrightable subject matter. A person who sketches the car, mountain, or motorcycle easily satisfies the requirement of independence.¹⁵⁰

146. *Meshwerks, Inc. v. Toyota Motor Sales U.S.A., Inc.*, 528 F.3d 1258, 1264 (10th Cir. 2008).

147. *See supra* notes 53-62 and accompanying text.

148. *Bleistein*, 188 U.S. at 249-50; *see also* *Gracen v. Bradford Exch.*, 698 F.2d 300, 305 (7th Cir. 1983) (discussing importance of *Bleistein* approach).

149. *See supra* note 53 and accompanying text.

150. To the extent that some of Toyota’s car designs were protected by design patents, Toyota authorized Meshwerks to make the digital models of the cars, so Toyota probably had no

b. Create a Work

The next question is whether Meshwerks exercised intellectual production, thought, or conception to create something in a format within the subject matter of copyright. This requirement is also met. First, the digital wire-frame depictions of the Toyota car undoubtedly fall within the subject matter of copyright as pictorial or graphic works.¹⁵¹ The only question, then, is whether individuals at Meshwerks exercised enough human thought in the process of creation for the law to consider them to be the originators or creators of the content.

Had a computer program created entirely the wire frames of the Toyota car, the models arguably would not meet the second requirement of originality.¹⁵² However, in this case, Meshwerks employees spent eighty to one hundred hours per car manually fine-tuning, correcting, and adding further details (including door handles, headlights, and wheels) to the initial computer-generated model to “sculpt” the model into something more realistic—a two-dimensional graphic that looked three-dimensional.¹⁵³ Even the Tenth Circuit acknowledged that Meshwerks exercised significant human thought in creating the wire-frame model of the Toyota car: “we do not for a moment seek to downplay the considerable amount of time, effort, and skill that went into making Meshwerks’ digital wire-frame models.”¹⁵⁴ If simply pressing a button to snap a photograph is a sufficient act of authorship or creation,¹⁵⁵ then it is hard to imagine that spending over eighty hours digitally modeling a realistic wire-frame depiction of a car—an exercise of skill probably few, untrained lay people could demonstrate—is not a sufficient act of authorship or creation. The key is not the time or labor involved, but rather the artistic thought required to conceptualize and depict something two dimensional to appear three dimensional—and in realistic fashion.¹⁵⁶

claim that Meshwerks infringed Toyota’s design patents. *See Meshwerks*, 528 F.3d at 1266 (discussing Toyota’s design patents).

151. *See* 17 U.S.C. § 101 (2006) (defining pictorial, graphic, and sculptural works).

152. *Cf.* *Lucky Break Wishbone Corp. v. Sears Roebuck & Co.*, 373 F. App’x 752, 754-55 (9th Cir. 2010) (finding originality in 3D plastic wishbone based on scanned dimensions of actual wishbone and other additions made by human input).

153. *Meshwerks*, 528 F.3d at 1260-61.

154. *Id.* at 1268.

155. *See* *Rockford Map Publishers, Inc. v. Directory Serv. Co. of Colo.*, 768 F.2d 145, 148 (7th Cir. 1985) (“A photograph may be copyrighted, although it is the work of an instant and its significance may be accidental.”).

156. *See supra* notes 68-81, 111-24 and accompanying text.

c. Modicum of Creativity

The final question is whether the digital wire-frame models of the Toyota car have a minimal level of creativity. The Tenth Circuit did not make a judgment on this factor, but parts of its opinion suggest that the court doubted this factor was met.¹⁵⁷ Analogizing a digital wire frame to a photograph, the court reasoned that the “unadorned” Toyota wire frame must be “filtered out” of the originality analysis just as a bottle in a photograph of the bottle supposedly would:

And, by analogy . . . we hold that the unadorned images of Toyota’s vehicles cannot be copyrighted by Meshwerks and likewise must be filtered out. To the extent that Meshwerks’ digital wire-frame models depict only those unadorned vehicles, having stripped away all lighting, angle, perspective, and “other ingredients” associated with an original expression, we conclude that they have left no copyrightable matter.¹⁵⁸

The Tenth Circuit’s “filtering” out of the unadorned Toyota car from the creativity analysis was erroneous. First of all, the *Skyy* cases on which the Tenth Circuit relied did not undertake any such “filtering” analysis for determining the threshold question of originality. Instead, to the extent any filtering of unprotected elements occurred, it occurred in the infringement analysis only after applying a liberal test of originality to find that the photograph met the test.¹⁵⁹

More fundamentally, unlike a photograph of a bottle, Meshwerks’s digital wire-frame model of the car does not depict an actual wire-frame car that exists in real life—Toyota’s cars do not have wire frames in their construction or assembly. In this sense, Meshwerks’s wire-frame car depiction is a *fictitious* or *imagined* representation of the car.¹⁶⁰ The three-dimensional wire frames are, in other words, fictitious incremental additions by Meshwerks to the Toyota car design. Such imagined representations—which exist nowhere in the actual car and which Meshwerks sculpted manually on the computer—should easily pass the test of creativity.

Granted, some imaginary representations of objects in the world may be too crude to pass the low threshold. A simple stick

157. See *Meshwerks*, 528 F.3d at 1265.

158. *Id.* at 1266.

159. See *Ets-Hokin v. Skyy Spirits, Inc. (Skyy II)*, 323 F.3d 763, 765-66 (9th Cir. 2003); *Skyy I*, 225 F.3d 1068, 1076-77 (9th Cir. 2000).

160. See Subotnik, *supra* note 27, at 1517. The *Meshwerks* court’s emphasis on the “unadorned” nature of the wire-frame digital model of the car masked the creativity involved in depicting wire frames that do not exist in the actual car. See *Meshwerks*, 528 F.3d at 1265. For example, imagine someone created a 3D wire frame of a nude human body. Even though the wire frame of the human body was “unadorned,” arguably the rendering of the 3D wire frame of the nude human body would possess some “creative spark.”

figure of a human being might be so crude or common to fail the low threshold of creativity.¹⁶¹ However, nowhere in the opinion did the Tenth Circuit suggest the wire-frame models were like stick figures. Meshwerks's model of the car (shown above in Figure 1) had considerable detail to make the realistic appearance of three-dimensional shape, contours, and depth of the car on a two-dimensional screen. Meshwerks chose to position the wire-frame car against no background, at different angles to which the car can be rotated, with wire frames transversing the car's contours, plus black or gray lines, making the car, in effect, see-through in places. These detailed features, parts of which are purely imaginary, show some "creative spark, no matter how crude."¹⁶² That the parties intended to have Meshwerks create a digital car model that could serve as the basis for Toyota to modify and use in commercial advertisements does not disqualify Meshwerks's digital depiction of its creativity.¹⁶³

Finally, as discussed above, the court based its analysis on the false premise that the elements of photography that make photos original—such as lighting and staging—are the same for digital modeling. They are not. Digital modeling in realistic fashion may involve far more human input than snapping a photo. Moreover, the photograph cases the court relied on—*Skyy I* and *II*—reaffirmed the approach of the majority of courts that "no photograph, however simple, can be unaffected by the personal influence of the author"¹⁶⁴ and, therefore, "almost any[] photograph may claim the necessary originality to support a copyright merely by virtue of the photographers' [sic] personal choice of subject matter, angle of photograph, lighting, and determination of the precise time when the photograph is to be taken."¹⁶⁵ Under the prevailing approach to photography, Meshwerks's model should easily pass the test of creativity.

161. See Dean D. Niro, *Protecting Characters Through Copyright Law: Paving a New Road Upon Which Literary, Graphic, and Motion Picture Characters Can All Travel*, 41 DEPAUL L. REV. 359, 374-75 (1992).

162. *Feist Publ'ns, Inc. v. Rural Tel. Serv. Co.*, 499 U.S. 340, 345 (1991) (quoting 1 MELVILLE B. NIMMER & DAVID NIMMER, NIMMER ON COPYRIGHT § 1.08(C)(1) (1990)).

163. See *Bleistein v. Donaldson Lithographing Co.*, 188 U.S. 239, 251 (1903) (concluding circus pictures used for commercial advertisements were not disqualified from copyright); James Elkins, *Art History and the Criticism of Computer-Generated Images*, 27 LEONARDO 335, 336 (1994) ("[I]f we look away on account of the unpleasant glare of technological references, we risk missing the development of new meanings—and most importantly, we tend to assume that the technology is contributing something superficial—such as efficiency—when it may also be bending artistic purposes in new directions.").

164. See *Skyy I*, 225 F.3d at 1076 (quoting *Jewelers' Circular Publ'g Co. v. Keystone Publ'g Co.*, 274 F. 932, 934 (S.D.N.Y. 1921)).

165. See *id.* (quoting 1 MELVILLE B. NIMMER & DAVID NIMMER, NIMMER ON COPYRIGHT § 2.08(E)(1) (1990)).

2. 3D Printers

The proposed test of originality will better enable courts to evaluate the potential originality of creations by new technologies, such as 3D printers. Some creations from 3D printers will have no trouble passing the test of originality, while others may face difficulties.

a. Independently

Creations produced by 3D printers can satisfy the independence requirement if the designs of the objects utilized by 3D printers are not copied from someone else's work. For example, if a person created a computer-aided design (CAD) of a toy train from scratch, and not copied from elsewhere, the design would satisfy the independence requirement. Both the computer design (a pictorial work) and the 3D toy train produced (a sculptural work) receive copyright protection, provided that they satisfy the other two requirements of originality. On the other hand, if a person simply downloaded someone else's CAD of the toy train from the Internet, the copied design and 3D toy train produced would flunk the independence requirement. The person would not have independently created the CAD and toy; instead, he merely copied the designs.

A more difficult question arises if the design of the work or CAD is in the public domain (meaning not protected by copyright¹⁶⁶), but still allows some user customization of the object printed, such as color, shape, and size. Imagine that the CAD software allows the user to manipulate a public domain CAD for a toy train by selecting different colors, shapes, and sizes for the train. What if the user picked the color and size for the train, but the software did everything else? Would that be enough of an incremental addition to the public domain CAD for the addition to be "independent," and not just copied?

These additions are probably not enough to satisfy the independence requirement. Copyright law allows people to copyright their incremental additions to public domain works if those additions satisfy originality. Courts have required "more than merely [a] trivial" variation from the public domain work.¹⁶⁷ Otherwise, the subsequent work is nothing more than a copy of the public domain work, which is free for all to copy.¹⁶⁸ For example, in the famous case

166. See generally *Brown v. Latin Am. Music Co.*, 498 F.3d 18, 23 (1st Cir. 2007) (describing public domain).

167. See, e.g., *United States v. Hamilton*, 583 F.2d 448, 450 (9th Cir. 1978).

168. See *id.* at 452 n.5 ("We emphasize that compilations or new arrangements of material which represent merely trivial additions to or omissions from a preexisting map will not

Batlin, the U.S. Court of Appeals for the Second Circuit held that a new plastic version of the classic Uncle Sam bank, already in the public domain, lacked originality because the plastic bank was “‘extremely similar to the cast iron bank, save in size and material’ with the only other differences, such as the shape of the satchel and the leaves in the eagle’s talons being ‘by all appearances, minor.’”¹⁶⁹ Accordingly, the plastic bank was “practically an exact copy” of the Uncle Sam bank in the public domain.¹⁷⁰

The hypothetical toy train based on a public domain CAD would face similar problems. Copyright law would likely consider changes to the color and size to be merely trivial variations from the public domain design and, therefore would consider the resulting toy trains to be mere copies of the public domain design.¹⁷¹ If the user of the CAD software made greater changes to the public domain train, such as adding new features or styling to the body of the train, the user would have a better chance of satisfying the independence requirement.

b. Create a Work

Creating one’s own CAD of a toy train from scratch would easily satisfy the “create” requirement. Creating the design from scratch manifests intellectual conception, thought, and production—all “founded in the creative powers of the mind.”¹⁷² The toy train is a type of work that falls within the subject matter of copyright. By contrast, if a user simply downloaded someone else’s CAD of the toy train and pressed “print” on the 3D printer, she would not satisfy the second requirement. The toy train did not originate from the user’s mental creation. Likewise, in the cases involving public domain CADs that allow customization, a user may have a harder time satisfying the second requirement if the choices of customization—such as color, size, and shape—are modest, resulting

support a copyright absent some additional original work. For example, copying the outline of the United States and the boundaries of each state cannot be said to involve any element of original choice or arrangement.” (citation omitted)).

169. *L. Batlin & Son, Inc. v. Snyder*, 536 F.2d 486, 489 (2d Cir. 1976) (en banc).

170. *Id.*

171. *Cf. Darden v. Peters*, 488 F.3d 277, 287 (4th Cir. 2007) (“Additions to the preexisting maps such as color, shading, and labels using standard fonts and shapes fall within the narrow category of works that lack even a minimum level of creativity”); 37 C.F.R. § 202.1(a) (2006) (discussing Copyright Office approach to coloring). *But cf. Streetwise Maps, Inc. v. VanDam, Inc.*, 159 F.3d 739, 748 (2d Cir. 1998) (discussing use of various colors in map as a part of overall creative arrangement).

172. *Feist Publ’ns, Inc. v. Rural Tel. Serv. Co.*, 499 U.S. 340, 346 (1991) (quoting *Trade-Mark Cases*, 100 U.S. 82, 94 (1879)).

in only trivial variations from the public domain designs. Thus, in many cases, the first two requirements—independent and create—will likely track each other.

However, in some cases, the putative work may satisfy the independence requirement, but fail the “create” requirement. For example, the objects printed by the 3D printer may be useful articles—such as a can opener or hammer—that do not fall within the subject matter of copyright. Even though the objects may be independently produced and not copied, they fail the “create” requirement of embodying a format that falls within copyrightable subject matter.

c. Modicum of Creativity

For many works created on a 3D printer, the third requirement will be easy to satisfy. The court must examine the object produced by the 3D printer to see if it has the “creative spark” and is not so mechanical “to be expected as a matter of course.”¹⁷³ Moreover, under the *Bleistein* proviso, courts are to avoid judging the artistic worth of various works “outside of the narrowest and most obvious limits.”¹⁷⁴

Under this lenient approach, a CAD of a toy train made from scratch, even if “crude, humble, or obvious,” would likely satisfy the minimal level of creativity. However, if a user simply downloaded someone else’s CAD of a toy train and pressed “print” on the 3D printer, there is no creativity on the part of the user. The user has added nothing to the CAD.¹⁷⁵ Likewise, if a user copied a public domain CAD of a toy train and changed only the color, size, and shape, the user’s additions may face a difficult time satisfying even the low threshold of creativity.

3. Siri on iPhone

Siri on the iPhone presents even more perplexing questions for originality. The three-part test of originality illuminates the key issues. As explained below, one of the most perplexing issues will arise if Siri itself creates answers on its own through artificial intelligence: To what extent are Siri’s answers the original expression of an author?

173. *Id.* at 363.

174. *Bleistein v. Donaldson Lithographing Co.*, 188 U.S. 239, 251 (1903).

175. As shown by this example, the parts of the originality test sometimes overlap. By definition, a mere copy cannot be the result of the copier’s independent creation, or possess a modicum of creativity added by the copier. However, each part of the test has a slightly different function that surfaces, especially in more difficult cases.

a. Independently

Whether Siri satisfies the first requirement of independence will depend on the source for Siri's answers. To the extent Siri's answers are not copied from outside sources, the answers will meet the independence requirement.

Imagine that Siri provides the following answers, at different times, to the question, "What is the meaning of life?"

- (1) "Try and be nice to people, avoid eating fat, read a good book every now and then, get some walking in, and try to live together in peace and harmony with people of all creeds and nations." (created by Siri programmer);
- (2) "42." (quoted from other source by Siri programmer); and
- (3) "I don't know. But I think there's an app for that." (created by artificial intelligence).¹⁷⁶

For the purposes of this discussion, imagine that the first answer was created by a Siri programmer and programmed into the software for Siri's response, the second answer was a quote from the *Hitchhiker's Guide to the Galaxy* programmed into Siri's software, and third answer was created by the artificial intelligence of Siri itself.

In terms of the independence requirement, the second answer presents the easiest scenario. Because the answer is simply a verbatim quote, it was not independently produced. It therefore fails the first part of the originality test. By contrast, the first and third answers were not copied from other sources. The first was independently produced by Siri's programmer, while the third was independently produced by Siri, the artificial intelligence. Both satisfy the independent requirement. The third answer presents an interesting question of "authorship," which is better addressed under the second requirement.

b. Create a Work

Whether Siri's answers satisfy the second requirement will again depend on the source of Siri's answers. An answer copied from an outside source, such as the second answer above, will not satisfy the "create" requirement. But if Siri's programmers created the answers (e.g., the first answer above) or if Siri itself created the answers (e.g., the third answer above), these answers may satisfy the "create" requirement.

176. The answers in the hypothetical are ones that Siri actually provides. However, this hypothetical imagines that one of the answers Siri itself created through artificial intelligence (instead of being pre-programmed), even though Siri is probably not (yet) sophisticated enough to generate answers on its own.

Some human conception and production of expression are required for a person to write the following answer: "Try and be nice to people, avoid eating fat, read a good book every now and then, get some walking in, and try to live together in peace and harmony with people of all creeds and nations." Such expression—fixed somewhere in Siri's database or memory and also viewable on the iPhone screen and narrated in audio—falls within copyrightable subject matter, at least as a literary work.¹⁷⁷

The more difficult question is whether Siri's artificial intelligence-generated answer satisfies the "create" requirement. Scholars have long debated the problem of authorship presented by AI and computer-generated works.¹⁷⁸ Some favor allowing copyrights and treating the programmer, the AI, and/or the user as the author.¹⁷⁹ Others take the contrary view.¹⁸⁰ This Article does not take a final position in this ongoing debate over AI generated works.¹⁸¹ For this Article's purposes, it is sufficient to recognize that the second part of the originality test raises a fundamental question of whether

177. The textual component of Siri's answer would qualify as a literary work. See 17 U.S.C. § 101 (2006) ("Literary works" are works, other than audiovisual works, expressed in words, numbers, or other verbal or numerical symbols or indicia, regardless of the nature of the material objects, such as books, periodicals, manuscripts, phonorecords, film, tapes, disks, or cards, in which they are embodied.").

178. See, e.g., Woodrow Barfield, *Intellectual Property Rights in Virtual Environments: Considering the Rights of Owners, Programmers and Virtual Avatars*, 39 AKRON L. REV. 649, 660-73 (2006); Timothy L. Butler, *Can a Computer be an Author? Copyright Aspects of Artificial Intelligence*, 4 HASTINGS COMM. & ENT. L.J. 707, 744-46 (1982); Evan H. Farr, *Copyrightability of Computer-Created Works*, 15 RUTGERS COMPUTER & TECH. L.J. 63, 79-80 (1989); Karl F. Milde, Jr., *Can a Computer be An "Author" or an "Inventor"?*, 51 J. PAT. OFF. SOC'Y 378, 401-04 (1969); Arthur R. Miller, *Copyright Protection for Computer Programs, Databases, and Computer-Generated Works: Is Anything New Since CONTU?*, 106 HARV. L. REV. 977, 1036-37 (1993); Susan H. Nycum & Ivan K. Fong, *Artificial Intelligence and Certain Resulting Legal Issues*, 1985 COMPUTER LAW. 1, 6; Pamela Samuelson, *Allocating Ownership Rights in Computer-Generated Works*, 47 U. PITT. L. REV. 1185 (1986); Andrew J. Wu, *From Video Games to Artificial Intelligence: Assigning Copyright Ownership to Works Generated by Increasingly Sophisticated Computer Programs*, 25 AIPLA Q.J. 131, 173-74 (1997).

179. See, e.g., Butler, *supra* note 178, at 744-46 (various entities determined by imaginary author); Farr, *supra* note 178, at 79-80 (programmer); Milde, *supra* note 178, at 401-04 (AI); Miller, *supra* note 178, at 1056-57 (possible allocation of copyright among different people); Nycum & Fong, *supra* note 178, at 1, 6 (AI software copyright owner and user); Samuelson, *supra* note 178, at 1192 (user); Wu, *supra* note 178, at 173-74 (possible allocation among programmer, user, and AI if it can be incentivized); Saif M. Khan, *Creativity by Artificial Intelligence: Who Gets the Copyright?* (unpublished manuscript) (on file with author) (possible allocation to user, programmer acting as user, and possibly to AI if they can be incentivized or pass Turing test).

180. See Ralph D. Clifford, *Intellectual Property in the Era of the Creative Computer Program: Will the True Creator Please Stand Up?*, 71 TUL. L. REV. 1675 (1997).

181. This author's preliminary view is against recognizing AI created works as original works of authorship and leaving those works unprotected by copyright.

copyright's scope should include nonhuman creators that create practically all of the expression.

c. Modicum of Creativity

Siri's first and third answers above are creative enough to pass the modicum of creativity test. One might question whether the third answer, consisting of only ten words, is long enough to satisfy the creativity requirement.¹⁸² However, it is more than just a short phrase and perhaps the law should consider it within the question-and-answer context, which together can constitute a joint work.¹⁸³ Even if evaluating Siri's answer alone, recent cases have recognized that short sentences (even haiku) can be copyrightable.¹⁸⁴ By contrast, the second answer, a mere copied quote, fails the creativity test.

C. Advantages of the Three-Part Test of Originality

As demonstrated by the previous discussion, reconfiguring the test of originality to a three-part test helps to understand better the elements required for originality. Delineating precisely what each element requires helps courts avoid confusion over or conflation of the various elements of originality, as was evident in the *Meshwerks* case.¹⁸⁵ Although the three-part test is not a mathematical formula that mechanically determines whether a work is original, the test adds greater precision to the analysis. In difficult cases, such as those raised by AI and 3D printing, the three-part test helps to identify the proper questions that courts must answer under the respective parts of the test.

182. Cf. *CMM Cable Rep, Inc. v. Ocean Coast Props., Inc.*, 97 F.3d 1504, 1519-20 (1st Cir. 1996) (holding short phrases are not copyrightable).

183. See Andrea S. Hirsch, Comment, *Copyrighting Conversations: Applying the 1976 Copyright Act to Interviews*, 31 AM. U. L. REV. 1071, 1081-82 (1982). Whether the Q&A satisfies fixation of a work is an interesting question. The Q&A on Siri appears in text and audio form on the iPhone 4S at least long enough for the person to read it. That may be enough for fixation under current law. See *MAI Sys. Corp. v. Peak Computer, Inc.*, 991 F.2d 511, 518-19 (9th Cir. 1993) (discussing fixation of a copy of a program in temporary RAM).

184. See *Applied Innovations, Inc. v. Regents of the Univ. of Minn.*, 876 F.2d 626, 635 (8th Cir. 1989) (finding originality in "test statements [that] are short, simple, declarative sentences, but they are not merely fragmentary words and phrases within the meaning of 37 C.F.R. § 202.1(a)"); *Stern v. Does*, No. CV-09-01986-DMG (PLAx), 2011 WL 997230, at *6 (C.D. Cal. Feb. 10, 2011) ("[T]he copyrightability of a very short textual work—be it word, phrase, sentence, or stanza—depends on the presence of creativity."); *Religious Tech. Ctr. v. Lerma*, No. 95-CV-1107-A, 1996 WL 633131, at *4 (E.D. Va. Oct. 4, 1996) (suggesting haiku is copyrightable); see also Stephanie T. North, Note, *Twitterright: Finding Protection in 140 Characters or Less*, 11 J. HIGH TECH. L. 333 (2011) (analyzing possible originality in tweets).

185. *Meshwerks, Inc. v. Toyota Motor Sales U.S.A., Inc.*, 528 F.3d 1258 (10th Cir. 2008).

III. RESPONDING TO CONCERNS

This Part addresses concerns to the proposed three-part test of digital originality and shows why the test is, on a balance, an improvement over the current approach.

A. Complicating Originality

Some may object to the proposed test as needlessly complicating the doctrine of originality. Critics may contend that the three-part test yields very little additional insight beyond the two-part test that already applies and that a special test that applies only to digital creations may create unnecessary confusion for courts. For example, should digital photographs now be analyzed under the three-part test?

The criticism of complexity has some validity. Switching to a three-part test does add a measure of complexity to the analysis beyond the current two-part test. Yet the added complexity is justified if it yields more reasoned and informed results in complex cases. Breaking down the *Feist* test into three elements emphasizes the distinct contributions each part of the test provides to the analysis.

As Figure 3 depicts below, the different parts of the test perform different roles. In some cases, a work may satisfy the independence and creativity requirements, but not the second requirement of creating a work (for example, functional know-how or useful articles independently created, or, arguably, a work created solely by artificial intelligence). Likewise, in other cases, a work may satisfy the independence and “create” requirements, but not the modicum of creativity requirement (for example, the white pages phone directory in *Feist*). As explained above, Meshwerks’s wire-frame depictions of the car satisfy each part of the test of originality, whereas a mere copy of someone else’s work will fail each part.¹⁸⁶ Understanding what each part of originality is testing will help courts avoid committing the same mistake as the Tenth Circuit did in *Meshwerks*.

186. See *supra* notes 146-82 and accompanying text.

Figure 3. Analysis Under Three-Part Test of Originality

	Independently	Create/Format	Modicum of Creativity
Creating Coke formula	✓	X	✓
AI-generated work	✓	X	✓
White pages phonebook in <i>Feist</i>	✓	✓	X
3D wireframes in <i>Meshwerks</i>	✓	✓	✓
Copied work	X	X	X

Moreover, the concern about creating two different tests of originality is misplaced. There is only one test of originality. Both formulations of the test (two-part and three-part) derive directly from *Feist*.¹⁸⁷ Many run-of-the-mill copyright cases may not require an extended analysis of originality because the works in question easily pass the test, however formulated. The proposed test does not require more work for courts or the Copyright Office with respect to these easy cases. Instead, the three-part test provides greater guidance on originality especially for those difficult cases or cases of first impression presented by new digital technologies.

B. Backsliding to Photography or Non-Digital Works

Related to the first concern, some may object to the proposed test as possibly raising the bar of originality for works that courts have long since deemed sufficient to pass the low threshold. Photography is one example—should digital photographs be analyzed under the three-part test of digital originality? And, if so, then under the reconfigured test, some photographs taken simply by a person pressing a button—with today’s sophisticated automatic cameras doing pretty much everything else—may not contain enough “intellectual production, . . . thought, [or] conception.”¹⁸⁸ In other words, the law may view merely pressing a button on a camera as akin to pressing a button on a 3D printer. Neither involves enough creative thought for authorship, one might conclude.

187. *Feist Publ'ns, Inc. v. Rural Tel. Serv. Co.*, 499 U.S. 340 (1991).

188. *Id.* at 347.

Other scholars have debated more extensively whether courts should subject photographs to greater scrutiny for originality.¹⁸⁹ The Supreme Court left the door open to that possibility in *Burrow-Giles*,¹⁹⁰ although most lower courts have rejected the possibility and applied a very low threshold to photographs.¹⁹¹ It goes beyond the scope of this Article to revisit that debate. On one hand, principles of stare decisis may militate in favor of retaining the prevailing approach to photographs, as may other prudential reasons such as those articulated by Professor Subotnik.¹⁹² On the other hand, reexamination of the photography case law may be helpful in better understanding what purposes originality should serve. This Article's proposal is compatible with either approach.

The same response applies to fears that the three-part test may eventually creep back to cases involving nondigital works and make it more difficult for them to satisfy originality. The proposal gives courts the option to limit the proposed test to new types of digital creations that raise issues of first impression. The proposal provides courts guidance to handle these novel issues, rather than requiring courts to revisit old cases or well-known types of works.

C. Defending Meshwerks

Finally, some may disagree with this Article's criticism of *Meshwerks* and argue that the Tenth Circuit correctly decided the case. Some may contend that the Toyota car design is copyrightable because it "can be identified separately from" the useful article of the car itself,¹⁹³ or that, in any event, copyright law should consider realistic depictions of uncopyrightable subject matter "copying" for the purposes of originality. For the reasons explained above, both arguments run counter to existing case law.¹⁹⁴ But, even assuming the possibility for disagreement, such disagreement justifies even further the need for reexamining the elements of the *Feist* test to drill

189. See Subotnik, *supra* note 27, at 1528-29.

190. See *Burrow-Giles Lithographic Co. v. Sarony*, 111 U.S. 53, 59 (1884) (questioning whether "ordinary production" of a photograph satisfies originality if "[i]t is simply the manual operation, by the use of these instruments and preparations, of transferring to the plate the visible representation of some existing object, the accuracy of this representation being its highest merit").

191. See *supra* note 66 and accompanying text.

192. See Subotnik, *supra* note 27, at 1528-29 ("[H]eightening the originality bar might distort artistic production or increase judicial tastemaking . . .").

193. 17 U.S.C. § 101 (2006) (defining "pictorial, graphic, and sculptural work"); see also *supra* note 53.

194. See *supra* notes 53, 56, 85, 110-15, and accompanying text.

down exactly what each element means. For far too long, these elements have remained opaque.

IV. CONCLUSION

For new types of digital creations, courts should reconfigure the test of originality into a three-part test, asking whether the work in question (1) was independently produced, (2) in a way that required the creative powers of the mind and resulted in a creation that falls within the subject matter of copyright, and (3) possesses a modicum of creativity. This test offers a more precise way to analyze whether originality exists in digital creations, especially in cases of first impression involving new technologies.